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09/177,729	10/23/1998	DAVID S. TAUBMAN	10960578-1	3513

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EXAMINER	
HARRIS, TIA M	
ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 01/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/177,729	Applicant(s) TAUBMAN, DAVID S.	
	Examiner Tia M Harris	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-6 and 8-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-6 and 8-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

The applicant's amendments to the specification have overcome the objections to the specification. Therefore, the objections are withdrawn.

Response to Arguments

1. Applicant's arguments with respect to claims 3-6 and 8-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claim 9 is objected to because of the following informalities: "the" should be inserted between "wherein" and "operator" (line 1 of the claim). Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 8 recites the limitation "the optical system matrix" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C.102 that form the basis for the rejections under this section made in this Office action:

Recent Statutory Changes to 35 U.S.C. § 102(e)

On November 2, 2002, President Bush signed the 21st Century Department of Justice Appropriations Authorization Act (H.R. 2215) (Pub. L. 107-273, 116 Stat. 1758 (2002)), which further amended 35 U.S.C. § 102(e), as revised by the American Inventors Protection Act of 1999 (AIPA) (Pub. L. 106-113, 113 Stat. 1501 (1999)). The revised provisions in 35 U.S.C. § 102(e) are completely

retroactive and effective immediately for all applications being examined or patents being reexamined. Until all of the Office's automated systems are updated to reflect the revised statute, citation to the revised statute in Office actions is provided by this attachment. This attachment also substitutes for any citation of the text of 35 U.S.C. § 102(e), if made, in the attached Office action.

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 in view of the AIPA and H.R. 2215 that forms the basis for the rejections under this section made in the attached Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

35 U.S.C. § 102(e), as revised by the AIPA and H.R. 2215, applies to all qualifying references, except when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. For such patents, the prior art date is determined under 35 U.S.C. § 102(e) as it existed prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. § 102(e)).

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 prior to the amendment by the AIPA that forms the basis for the rejections under this section made in the attached Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

For more information on revised 35 U.S.C. § 102(e) visit the USPTO website at www.uspto.gov or call the Office of Patent Legal Administration at (703) 305-1622.

7. Claims 6, 8-18, 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Acharya et al (6348929) (hereafter referred to as Acharya).

(Claims 8 and 18) As best understood by the language of the claim, Acharya discloses a method of processing a digital image produced by an optical system including a sensor that detects less than full color at each pixel location (Col 4, Lines 1-4; Col 11, Lines 29-47), the method comprising accessing an operator including an array of weights (Col 6, Lines 44-49; Col 7, Lines 26-39), values of the weights determined by at least one property of the optical system matrix (coefficients are determined by the location of the pixels in correlation to that of a center pixel), forming a plurality of input vectors from the image, each input vector including a plurality of pixel intensities (Col 6, Lines 49-51), and applying the operator to the input vectors to produce a full color digital image (Col 4, Lines 62-67; Col 5, Lines 1-3; Col 6, Lines 49-55).

(Claim 9) Acharya further discloses the operator compensates for degradation in the optical system by interpolating missing color components in all pixels of the image (Col 4, Lines 62-67; Col 5, Lines 1-3; Col 11, Lines 29-47).

(Claim 10) Acharya further discloses each input vector is formed from super pixels (Col 4, Lines 62-67; Col 5, Lines 1-3; Col 6, Lines 49-60).

(Claim 11) Acharya further discloses the operator is used for all resolutions, and a resulting fixed resolution image is resampled (Col 6, Lines 56-67; Col 7, Lines 1-13).

(Claim 12) Acharya discloses the operator is also based on a set of known images because once the images are captured they are known images.

(Claims 6 and 13) Acharya further discloses different operators are used for different images (edge vs. non-edge) (Col 7, Lines 41-58).

(Claim 14) Acharya further discloses a processor for performing the method of claim 8 (Col 3, Lines 59-61; Col 11, Lines 14-65).

(Claim 15) Acharya further discloses an article for a processor, the article including computer memory encoded with instructions for causing the processor to perform the method of claim 8 (Col 3, Lines 59-61; Col 13, Lines 57-67; Col 14, Lines 1-5).

(Claim 16) Acharya further discloses a digital camera including a processor programmed to perform the method of claim 8 (Col 11, Lines 14-65 –wherein the image capture device is that of a digital camera (see Col 13, Lines 33-36)).

(Claim 17) Acharya discloses the digital camera of claim 16 further comprises memory for storing a plurality of candidate operators; and wherein the processor is programmed to access the operator by selecting the operator from one of the plurality of candidates (Col 7, Lines 41-58; Col 11, Lines 48-65; Col 12, Lines 21-67; Col 13, Lines 1-4).

(Claim 20) See rejection of claims 14-15 above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya in view of Atkins et al (6466702) (hereafter referred to as Atkins).

Acharya discloses a method of generating a linear operator for demosaicing of a digital image by a digital camera as discussed above, but does not specifically disclose a standard noise model and a linear minimization technique are used to generate the coefficients from the camera parameters.

Atkins discloses an apparatus and method of building an electronic database for resolution synthesis wherein a standard noise model (training statistics) and a linear

minimization technique are used to generate the coefficients from the camera parameters (Col 11, Lines 6-47).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a standard noise model and linear minimization technique, in the manner taught by Atkins, in the method of Acharya, to obtain the mask that produces minimum error.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya in view of Kang et al (6256058) (hereafter referred to as Kang).

Acharya discloses a method of processing a digital image as discussed above, but does not specifically disclose the system also includes a lens system, wherein the at least one property by which weights are determined is focal length of the lens system.

Kang discloses a method of processing a digital image obtained by using lens system (110) wherein a weighted interpolation scheme is used to reduce the blurring effects caused by noise and digitization effects and incorrect focal length (see Abstract, Lines 15-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the steps of determining weights by the focal length of a lens system, in the manner taught by Kang, in the method of Acharya to reduce the blurring effects caused by noise and digitization effects and incorrect focal length.

11. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya in view of Nagasaki et al (5083150) (hereafter referred to as Nagasaki).

Acharya discloses a method of processing a digital image as discussed above, but does not specifically disclose the system also includes a lens system, wherein the at least one property by which weights are determined is focal length or f-number of the lens system.

Nagasaki discloses an automatic focusing apparatus wherein the true optimal value of interpolation, which is determined by a weighting coefficient of a filtering process, is based various factors including focal length and f-number (Col 22, Lines 10-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the steps of determining weights by the focal length and f-number of a lens system, in the manner taught by Nagasaki, in the method of Acharya to obtain the true optimal value of interpolation.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya in view of Yamamoto et al (6330085) (hereafter referred to as Yamamoto).

Acharya discloses a method of processing a digital image as discussed above, but does not specifically disclose the system also includes a lens system, wherein the at least one property by which weights are determined is a source of illumination used to generate the image.

Yamamoto discloses an image processing apparatus and method wherein a matrix color correction is performed by using a matrix in accordance with the monitor color temperature and type of illumination light (Col 10, Lines 66-67; Col 11, Lines 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the steps of determining weights by the source of illumination used to generate the image, in the manner taught by Yamamoto, in the method of Acharya since it is known that field variations in illumination source flux, and/or variations in reflectivity from different parts of the scanned subject, can affect the interpolationaccuracy adversely.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya in view of Spaulding et al (5805213) (hereafter referred to as Spaulding).

Acharya discloses a method of processing a digital image as discussed above, but does not specifically disclose the system also includes a lens system, wherein the at least one property by which weights are determined is a source of illumination used to generate the image.

Spaulding discloses multi-channel color image signals from a digital camera having multi-channel image sensors are corrected to account for variations in scene illuminant. This is accomplished by determining the scene illuminant and determining an optimum color-correction transformation in response to the scene illuminant that transform minimizes color errors between an original scene and a reproduced image by adjusting three or more parameters (see Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the steps of determining weights by the source of illumination used to generate the image, in the manner taught by Spaulding, in the method of Acharya since it is known that field variations in illumination source flux, and/or variations in reflectivity from different parts of the scanned subject, can affect the interpolation accuracy adversely.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sansom-Wai et al (6411331) discloses an automatic white balance detection and correction of an image captured in a digital camera wherein a demosaic function is provided to perform automatic white balance and to sharpen the image. Herley (6044177) discloses an artifact reduction decompression method and apparatus for interpolated images wherein a demosaic function to color interpolate an image to have a full 24-bit image is performed by bilinear interpolation.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tia M Harris whose telephone number is 703-305-4807. The examiner can normally be reached on M-F 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

tmh TMH
January 16, 2003

ANDREW CHRISTENSEN
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